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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/757,099	01/08/2001	Michael Geva	GEVA 6-2-4-21	6929

7590

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EXAMINER

WANG, GEORGE Y

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 11/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/757,099

Applicant(s)

GEVA ET AL.

Examiner

George Y. Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnham et al. (U.S. Patent No. 4,546,480, from hereinafter "Burnham") in view of DePoorter (WO 97/50133).
3. Regarding claims 1 and 9, Burnham discloses an electronic device and method of making an electronic device having an active region (fig. 4, ref. 46) located over a

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substrate (fig. 4, ref. 32). Burnham also teaches an undoped layer with a barrier region (fig. 4, ref. 36) including aluminum (col. 5, lines 48-56) located above the undoped layer, and a doped upper cladding layer (fig. 4, ref. 41) over the barrier region.

However, the reference seems to fail to depict that the undoped layer is positioned above the active region.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned the undoped layer above the active region since Burnham teaches an active layer where the active regions (fig. 4, ref. 47) are situated at the bottom. Therefore, one skilled in the art at the time the invention was made would have placed the active region under the undoped layer to maximize the quantum effects (col. 3, lines 25-28) associated with radiative recombination for radiation propagation (col. 3, lines 13-18).

4. As per claims 2 and 10, Burnham discloses an electronic device and method of making an electronic device as recited above where the barrier region is a number of barrier layers located between a plurality of undoped layers (col. 5, lines 48-56).

5. As to claims 3, 6, 11, and 14, Burnham discloses an electronic device and method of making an electronic device as recited above having a number of barrier layers ranging from about 1 to 8 layers each having a thickness of about 1 nm and where the undoped layers each have a thickness of about 10 nm (col. 1, lines 23-34).

6. Regarding claims 4-5 and 12-13, Burnham discloses an electronic device and method of making an electronic device as recited above with barrier layers composed of aluminum arsenide with 5-50% aluminum composition (col. 5, lines 48-56).

7. As per claims 7 and 15, the Burnham reference also teaches that there are no p-n junctions between the barrier and doped cladding (fig. 4).

8. Regarding claims 8 and 16, although the reference teaches a doped upper cladding (fig. 4, ref. 41), Burnham does not disclose it as being doped with zinc. Furthermore, the reference does not specifically teach the barrier region inhibiting the diffusion of zinc into the active region.

DePoorter discloses a semiconductor diode with an upper cladding doped with zinc (abstract). Furthermore, the reference teaches a barrier region that inhibits the diffusion of zinc into the active region (pg. 3, lines 21-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have doped the upper cladding with zinc and to construct zinc-inhibitive properties to the barrier layers since one would be motivated to alternatively have a high and low bandgap value (pg. 3, lines 21-35). Such values render the barrier layers highly effective and reliable in practice since zinc-inhibition in the layers encourage highly thin layers that have mechanical stress without the defects caused by degradation of charged ions, such as zinc atoms (pg. 3, lines 21-35).

***Response to Arguments***

9. Applicant's arguments filed 4 November 2002 have been fully considered but they are not persuasive.

Applicant's argument is that the Burnham reference does not teach "an undoped layer located over an active region, a barrier region including aluminum over the undoped layer, and a doped upper cladding layer over the barrier region." Examiner notes that other than a barrier region with aluminum is, in fact, clearly taught in the Burnham reference (see above). As for the other elements, Examiner believes Applicant has misconstrued the disclosure of the Burnham reference. The active layer taught by Burnham contains the active region, barrier region with aluminum, and alternating undoped regions. Therefore, Examiner notes the distinction in the above rejection and that is why there is a strong case for obviousness. Examiner maintains rejection on the same grounds.

***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any


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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 703-305-7242. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2000

gw  
November 25, 2002